AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS:

1. (currently amended): A thickness shear mode piezoelectric resonator for use in a sensor arrangement for detecting or measuring an analyte in a medium, ~~said resonator~~ comprising:
a quartz crystal plate ~~(7, 107, 207)~~ having a first crystal surface ~~(8, 108, 208)~~ and a second crystal surface ~~(9, 209)~~, wherein
said first crystal surface comprises ~~being provided with~~ a first electrode having a surface area of less than 15 mm^2 ~~(10, 110, 210) and~~ ;
said second crystal surface comprises ~~being provided with~~ a second electrode ~~(11, 211), characterised in that the first electrode has a surface area of less than 15 mm^2~~.

2. (original): The resonator of claim 1, wherein the surface area of the first electrode is less than 10 mm^2.

3. (currently amended): The resonator according to claim 1 ~~of claims 1 or 2~~, wherein the surface area of the first electrode is at least 0.05 mm^2~~, preferably 1-5 mm^2~~.

4. (currently amended): The resonator according to claim 1 ~~of any one of claims 1-3~~, wherein the surface area of the first electrode is smaller than the first crystal surface~~, the first electrode preferably having a surface area that is 0.1-90% of the crystal area~~.

5. (currently amended): The resonator according to claim 1 ~~of any one of claims 1-4~~, wherein the distance from the sensing electrode edge to the crystal edge is at least 0.2 mm~~, preferably 1 mm and more preferably 2 mm~~.

6. (currently amended): The resonator according to claim 1 ~~of any one of claims 1-5~~, wherein the first electrode ~~(110)~~ has a rectangular-shaped surface ~~that has the shape of a rectangle~~, having a first side ~~(15)~~ and a second side ~~(16)~~.

7. (currently amended): The resonator according to claim 1 ~~of any one of claims 1-6~~, wherein the first side is at least 0.1-10 times as long as the second side.

8. (currently amended): The resonator according to claim 1 ~~of any one of claims 1-6~~, wherein
the first crystal surface ~~(8, 108, 208)~~ is provided with a first contacting area ~~(12, 112, 212)~~ connected to the first electrode ~~(10, 110, 210)~~ ; and
the second crystal surface ~~(9, 209)~~ is provided with a second contacting area ~~(13)~~ connected to the second electrode ~~(11, 211, 311)~~.

9. (currently amended): The resonator of claim 8, wherein
the first electrode has a first side and a second side; and
the first contacting area ~~(12, 112, 212)~~ is connected to the second side ~~(16)~~ of the first electrode.

10. (currently amended): The resonator according to claim 1 ~~of any one of claims 1-9~~, wherein the first crystal surface and the second crystal surface ~~surfaces (8, 108; 9) of the quartz crystal (7, 107)~~ are flat.

11. (currently amended): The resonator according to claim 1 ~~of any one of claims 1-9~~, wherein the quartz crystal ~~(207)~~ is an inverted mesa~~, i.e. it has a thin central region in which the first electrode (210) is provided~~.

12. (currently amended): The resonator of claim 11, wherein ~~the first side of the crystal (207) has at least~~
the quartz crystal plate comprises a first recess ~~(19) in which the first electrode (210) is provided, said first recess (19)~~ having a wall ~~(24)~~ and a bottom surface ~~(21)~~ and a first electrode in the first recess;
the area of the bottom surface is ~~being~~ larger than the first electrode ~~(210)~~ ; and
~~wherein~~ the first electrode is arranged in the recess such that there is a distance between the electrode ~~edges (25)~~ and the recess wall ~~walls (24)~~.

13. (currently amended): The resonator of claim 11, wherein the shortest distance from the electrode ~~edge (25)~~ to the recess wall ~~walls (24)~~ is at least 0.01 mm.

14. (currently amended): A flow cell for use in an apparatus for detecting or measuring an analyte in a medium, comprising : ~~walls forming~~
a sensing chamber comprised of walls; ~~(26) together with~~
a resonator ~~(29)~~ according to claim 1; and ~~any one of claims 1-13, and~~
inlet and outlet openings ~~(27, 28)~~ for leading a fluid through the sensing chamber, wherein ~~characterised in that a part of the resonator (29) constitutes~~
one of the walls of the sensing chamber consists of a part of the resonator; and ~~is arranged such that~~
the first electrode of the resonator ~~(310, 410)~~ is ~~situated~~ inside the sensing chamber.

15. (currently amended): The flow cell of claim 14, wherein a ~~the~~ cross sectional area of the sensing chamber perpendicular to a ~~the~~ flow direction is less than 2,5 times a ~~the~~ cross sectional area of the inlet and outlet openings.

16. (original): The flow cell of claim 15, wherein the cross sectional area of the sensing chamber perpendicular to the flow direction is the same as the cross sectional area of the inlet and outlet openings.

17. (currently amended): The flow cell according to claim 14 ~~of any one of claims 14-16~~, wherein the sensing chamber has a volume of less than 2 µl.

18. (currently amended): The flow cell according to claim 14 ~~of any one of claims 14-17~~, wherein
the flow cell comprises a flow cell element ~~(32) that~~ ;
the flow cell element includes an outwardly open recess ~~(33), having~~ ;
the outwardly open recess has a bottom surface ~~(34)~~ and walls ~~(35), whereby said~~ the bottom surface and walls constitute the walls of the sensing chamber not constituted ~~provided~~ by the resonator ; ~~(29), and wherein~~
the resonator is a replaceable part ; and ~~, which is~~

the resonator is held against the flow cell element by a pressing force ~~so as~~ to cover the recess and ~~thus~~ form the flow cell.

19. (currently amended): The flow cell according to claim 14 ~~of any one of claims 14-17~~, wherein
the flow cell comprises a flow cell element ~~(32) that~~ ;
the flow cell element includes an outwardly open recess ~~(33), having~~ ;
the outwardly open recess has a bottom surface ~~(34)~~ and walls ~~(35), whereby said~~ the bottom surface and walls constitute the walls of the sensing chamber not constituted ~~provided~~ by the resonator ~~(29),~~ and ~~wherein~~
the resonator is attached to the flow cell element by an adhesive ~~so as~~ to cover the recess and ~~thus~~ form the flow cell.

20. (currently amended): The flow cell according to claim 18 ~~of claim 18 or 19~~, wherein
the flow cell element comprises a contact surface ~~(36),~~ against which the resonator is to be held~~, which~~
the contact surface is plane-parallel to the bottom surface of the outwardly open ~~(34) of the~~ recess ~~(33)~~ and ~~which~~ encircles the recess~~, and wherein~~ ; and
the recess has a geometrical shape that corresponds to a ~~the~~ geometry of the first electrode ~~(410)~~.

21. (currently amended): The flow cell according to claim 18 ~~of any one of claims 18-20~~, wherein the shortest distance from the electrode ~~edge~~ to the recess walls ~~(35)~~ is at least 0.01 mm.

22. (currently amended): A sensor arrangement for detecting or measuring an analyte in a medium, ~~characterised in that it comprises~~ comprising a flow cell according to claim 14 ~~any one of claims 14-20~~.

23. (currently amended): A method of sensing or measuring; comprising using a ~~The use of the~~ thickness shear mode resonator according to claim 1 to sense or measure ~~any one of claims 1-13 for sensing or measuring purposes~~.

24. (currently amended): The method according to ~~use of~~ claim 23, wherein the resonator is used to sense or measure ~~for sensing or measuring~~ of liquid samples.

25. (new): The resonator according to claim 1, wherein the surface area of the first electrode is 1-5 mm^2.

26. (new): The resonator according to claim 4, wherein the first electrode has a surface area that is 0.1-90% of the crystal area.

27. (new): The resonator according to claim 5, wherein the distance from the sensing electrode edge to the crystal edge is at least 1 mm.

28. (new): The resonator according to claim 27, wherein the distance from the sensing electrode edge to the crystal edge is at least 2 mm.